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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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|-----------------|-------------|----------------------|---------------------|------------------|

10/769,393

01/30/2004

Z. Jason Geng

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07/26/2005

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EXAMINER

WU, JINGGE

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/769,393

Applicant(s)

GENG, Z. JASON

Examiner

Jingge Wu

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on the amendment filed on 5/13/2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 23-26 and 35-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-3, 5-12, 14-22, 27-34 and 40-47 is/are rejected.
- 7) ☐ Claim(s) 4 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Applicants' response to the last Office Action, filed on May 13, 2003 has been entered and made of record.

Applicants' amendment has required new grounds of rejection. New grounds rejection are therefore presented in the Office Action.

Remark

Applicant's arguments regarding claims 19-22 and 46-47 have been fully considered, but they are not persuasive.

a. Applicant argues that Victor does not teach "Eigen-Ear". Thus, the rejection of claims 19-22 based on Victor should be withdrawn.

Examiner strongly disagrees Examiner would like to point out that Victor expressly mention Eigen-Ear in Section 2. In fact, the title of the section 2 of Victor is "Eigen faces" and "Eigen ears". In subsequent section 3, Victor mentions using the number of eigenvectors for testing the training images. Therefore, Victor clearly teaches Eigen-Ear and using the Eigen Ears to match the images via well known PCA technique (eigen approach fig.1).

b. Applicant further argues that neither Victor nor Bhanu teaches or suggests generating multiple 2-D image based on a 3-D image. Victor does not mention 3-D image and Bhanu teaches using "2D histogram". Furthermore, no prior arts reference of

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record teaches "each two-dimensional image having a varied orientation or illumination condition based on a corresponding three-dimensional image" as claimed.

Examiner disagrees. Bhanu teaches 2-D histogram as well as range images (only z coordinates showed in the image) (see fig. 5 and fig. 6, note that the 2-D images set are derived (generated) from the 3-D images of fig. 4, page 95-96). Moreover, Victor expressly mentions "the lighting arrangement and positioning of lights, camera.." which " taken on different days" or different expression (section 3, page 430 and table 1 and 2 page 431 and 432, abstract). one having ordinary skill at the time the invention was made would see using the teachings of Bhanu and Victor would have been obvious to was made to use combine the features taught in Bhanu and Victor in order to not only using 3-D ear image as biometrics but also recognizing the ear image in different conditions such as various lightings.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 19-22 are rejected under 35 U.S.C. 102(b) as being anticipated by the article "An evaluation of Face and ear biometrics" by Victor et al. (a reference of PTO 1449).

As to claim 19, Victor discloses an image matching method (note that gallery set of known images matching the probe set of unknown images) comprising: performing a Eigen-Ear identification (page 429-430, note that the third step of Eigen-Ear approach is the identification step) .

As to claim 20, Victor further discloses steps of eigen-ear and performing an eigen ear classification (training and choosing based on the top eigen values) and performing an Eigen-Ear recognition (matching) on the plurality 2-D images (fig. 1 and fig. 2, page 429-430).

As to claim 21, Victor further discloses weight factor (Eigen vectors) of each pf the 2-D images (fig. 1-fig. 2, page 429-430), and the 2-D images being classified according to the weight vectors (fig. 1-fig. 2, page 429-430).

As to claim 22, Victor further discloses the eigen-ear recognition procedure comprises identifying said image of a subject's ear as belonging to a class if a vector in said database is found that minimizes a Euclidean distance to said weight vector below a threshold value (page 429-430, PCA is inherent for eigen classification and find the right image by finding minimized distance of eigen vectors (or difference) between the gallery set and probe set).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-18, 27-34, 40-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Victor in view of the article "Human ear recognition in 3D" by Bhanu et al. (a reference of PTO 1449).

As to claim 1, Victor discloses a method of automatic human identification; said method comprising:

matching an image of a subject's ear against a database of images (fig. 1 and 2) of identified ears to identify said subject (page 429-430),

wherein each of said plurality of two-dimensional images represents a varied orientation or illumination condition on said three-dimensional image (fig 2, table 1 and 2, page 430-432).

Victor does not mention 3-D image.

Bhanu, in an analogous environment, discloses:

the database of images comprises a three-dimensional image of an identified subject's ear of each of a plurality of identified subjects (abstract);

generating a plurality of two-dimensional images of said identified subject's ear based on said three-dimensional image (figs. 5-6, page 93-94, see remarks above),

one having ordinary skill at the time the invention was made would see using the teachings of Bhanu and Victor would have been obvious to was made to use combine the features taught in Bhanu and Victor in order to not only using 3-D ear image as biometrics but also recognizing the ear image in different conditions such as various

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lightings.

As to claim 2, Victor further discloses the method of claim 1, further comprising generating said database of images of identified ears (fig. 1, page 429-430).

As to claim 3, Bhanu further discloses:

generating a three-dimensional image of an identified subject's ear (abstract);

generating a plurality of two-dimensional images of said identified subject's ear based on said three-dimensional image (figs. 5-6, page 93-94, see remarks above),

As to claims 5-6, Victor further discloses a step of eigen-ear and performing an eigen ear classification and recognition (fig. 1, page 429-430, see also claim 19).

As to claim 7, Victor further discloses weight factor for eigen ear (page 429-430).

As to claim 8, Victor further discloses the eigen-ear recognition procedure comprises identifying said image of a subject's ear as belonging to a class if a vector in said database is found that minimizes a Euclidean distance to said weight vector below a threshold value (page 429-430, PCA is inherent for eigen classification).

As to claims 11-12, 14-17, the discussions are addressed with regard to claims 1-2, 5-8.

As to claims 40-45, the discussions are addressed with regard to claims 1-2, 5-8.

As to claim 27, the discussions are addressed with regard to claim 1.

As to claims 29-33, the discussions are addressed with regard to claims 1-2, 5-8.

As to claim 46, the discussions are addressed with regard to claims 1 and 3.

As to claim 47, Bhanu further discloses light projector (inherent if projected light used) and CCD (inherent if a camera used) to receive the reflected light off the ear (figs.

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2-6, page 94-96).

As to claims 9-10, 18, 28, and 34 Victor discloses a camera to take ear images but does not mention PTZ surveillance camera, omni-directional camera, rainbow-type 3D camera, high resolution ear image, and generating alarm if not matching the images.

However, Examiner takes Official Notice that those feature are well known in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the features in the method of Victor in order to get better ear images.

Allowable Subject Matter

Claims 4, 13, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications should be directed to Jingge Wu whose telephone number is (571) 272-7429. He can normally be reached Monday through Thursday from 8:00 am to 4:30 pm. The examiner can be also reached on second alternate Fridays.

Any inquiry of a general nature or relating to the status of this application should be directed to TC customer service whose telephone number is (571) 272-2600.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Amelia Au, can be reached at (571) 272-7414.

The Working Group Fax number is (571) 273-8300.

Jingge Wu

Primary Patent Examiner

